



UNITED STATES DEPARTMENT OF AGRICULTURE,  
WEATHER BUREAU.

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FOR THE

MONTH OF NOVEMBER, 1894.

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THE INFLUENCE OF THE MOON.

In "Popular Astronomy" by M. Camille Flammarion, the eminent French astronomer and scientist, a chapter is devoted to an interesting discussion of the influences of the moon on the weather.

He says that "the luminous or calorific action of our satellite is so feeble that it by no means explains the popular prejudices." In directing the most powerful lenses and reflectors towards the moon and then placing in their focus very sensitive thermometers nothing has ever been discovered that could lead to the conclusion that heat or cold is produced directly or through reflection. According to the most delicate experiments of famous scientists, the heat of the lunar rays which reach the surface of the earth is scarcely twelve-millionths of a degree. This almost imperceptible heat increases slightly as we rise from the earth's surface. As to its luminosity, photometric measures show that the light of the full moon is approximately 300,000 times less than that of the sun, and according to Professor Young, a sky completely covered with full moons would give only one-eighth of the light which we get from the sun. Thus it seems improbable that the heat and light which are

derived from our satellite have the power to influence our meteorological phenomena. On the subject of atmospheric tides M. Flammarion says in brief that "the sun and moon exercise their actions on the atmospheric air just the same as on the sea and there result in the atmosphere, true tides. But how can we ascertain their existence? We are not placed in a position to see the external surface of our atmosphere, as we see the surface of the sea. Situated at the bottom of the atmosphere, we cannot perceive the existence of atmospheric tides, as we could not perceive the tides of the ocean if we were placed at the bottom of the sea. The atmospheric tides can only be rendered perceptible by the periodical variations of the pressure of the atmosphere at the place where we are — that is to say, by the alternate increase and decrease in the height of the barometric column, which serves to measure this pressure. Calculation shows that this would only be some hundredths of an inch of difference in the barometer. The daily observations show that the height of the barometric column experiences at one and the same place accidental variations, which may amount to  $1\frac{1}{2}$ , 2, and even  $2\frac{1}{2}$  inches, and that it frequently varies several hundredths of an inch without any great

atmospheric disturbances. If the tides produced in the atmosphere by the action of the moon take part in these variations, it must be acknowledged that this part is very feeble, and that we are not warranted in seeing therein one of the principal causes of those changes of weather which we should have so much interest in being able to predict."

It has been found that at Paris the maximum of rainy days occurs between the first quarter and the full moon, and the minimum between the last quarter and the new moon; this has also been found true at Stuttgart, but at Poitiers, not 300 miles from Paris, just the opposite was found to be true. It will be seen, then, that with our present knowledge of the subject, very little can be based on the phases of the moon and their influences upon our weather.

M. Flammarion says regarding the faith of farmers and sailors in the predictions made during the various phases of the moon, "they only consider them to within a day or two before or after the change; noticing one fact in agreement, and neglecting ten which are not so. The prediction of the weather for a long time ahead cannot, then, inspire any confidence in so far as it is based on the motions of the moon. This prediction of the weather cannot, besides, be better based on other grounds. At present it is absolutely futile to venture conjectures on fine or bad weather for a year, a month, or even a week in advance."

A common saying among sailors is that "the moon eats up the clouds." They think that the clouds melt away as soon as the moonlight strikes them. This is also noticeable in the daytime; light clouds diminish and disappear in a few moments in consequence of a change in their height or the temperature of the surrounding air. In such a case the moon would have nothing to do with it, and would only enable us to see the fact which is not noticed on dark nights.

In closing the chapter on this subject the eminent physicist says: "Without being able to deny in an absolute manner the reality of some of the influences which have not been proved, observation and discussion do not warrant us in sharing the popular beliefs. Scientific men are sometimes accused of not yielding to evidence; but here the evidence is far from being real.

Without denying anything, science can only admit what is *ascertained*."

That there is an extensive field for research in this branch of meteorology, no one doubts, but it seems hardly probable that it can ever be accurately determined just how much, if any, the moon influences the weather changes and climatic conditions of the earth. Yet, science is ready to be convinced if any one will assert a single conclusive experiment.

FRED H. TOWER.

#### THE METEOROGRAPH.

Mr. Jules Richard of Paris has recently constructed a machine for recording the pressure, temperature, wind velocity and direction and the humidity, called the long-running Meteorograph. It is designed for the Mont Blanc Observatory which cannot well be attended or visited during the winter, and will run for about eight months without attention. The entire instrument is actuated by a 200-lb. weight descending from a height of about 20 feet in 8 months. A pendulum sets in motion a horizontal shaft which revolves once in twenty-four hours and this in turn communicates the motion to smaller bobbins and other various parts of the registering apparatus.

#### NOTES.

The crop correspondent at Deep River, Conn., Mr. F. C. Pratt, writes that there was a great difference in the yield of potatoes this year, some fields bearing 250 bushels to the acre and others hardly worth digging. Generally the correspondents reported quite a variation in the yield of potatoes, but no one states the different soils or attempts to explain the cause.

A recent number of the Mining Review states that Herr Grosse, of Ilmenau, Germany, has invented a thermometer, which uses toluol instead of alcohol or mercury. The advantages claimed are lower cost, a wider divergence between freezing and boiling points, a plainer reading of the temperature by reason of the dark colored liquid and the absence of danger to workmen's health in the manufacture.

## SUMMARY OF OBSERVATIONS FOR NOVEMBER, 1894.

3

Number.	STATION.	TEMPERATURE.								PRECIPITATION.					References to Notes.
		Mean Maximum.	Mean Minimum.	Mean Range.	Maximum.	Late.	Minimum.	Date.	Mean.	Total, including Melted Snow.	Snowfall.				
											Total.	On ground 15th of Month.	On ground at end of Month.	No. of days with precipitation.	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
	<i>Maine.</i>	°	°	°	°		°		°	in.	in.	in.	in.		
2	Bar Harbor . . .	..	..	..	..	1	6	30	32.5	2.52	8	..	..	10	2 *
3	Belfast . . . . .	..	..	..	56	23	4	29	34.2	3.53	22	T	2	9	
14	Calais . . . . .	43.2	25.2	18.0	60	3	8	20	30.5	2.65	15	..	4	8	1 *
28	Cornish . . . . .	..	..	..	55	1	—2	30	27.6	..	6	5	6	..	
25	Easton . . . . .	36.2	19.1	17.1	55	3	7	30	34.6	2.62	..	..	..	12	
9	Eastport . . . . .	39.9	29.1	10.8	56	1	—4	30	32.6	2.02	2	..	2	9	
5	Fairfield . . . . .	40.8	24.4	16.4	59	2	—7	30	28.7	2.97	10	..	..	9	
18	Farmington . . . .	39.6	17.8	21.8	63	3	4	30	33.0	2.21	5	..	..	10	
26	Gardiner . . . . .	40.7	25.4	15.3	58	1	0	30	28.3	2.78	15	..	..	9	
22	Houlton . . . . .	36.1	20.5	15.6	55	2	4	30	31.8	2.59	8	..	..	11	
8	Lewiston . . . . .	38.2	25.3	12.9	59	3	—4	30	31.6	..	8	..	..	..	1 *
301	Madison . . . . .	..	..	..	56	2	—4	30	27.3	2.48	10	4	2	9	
9	Mayfield . . . . .	35.4	19.2	16.2	54	..	..	..	..	..	..	T	T	6	
302	North Bridgton.	..	..	..	..	1	—5	30	29.8	1.24	T	T	T	..	
10	Orono . . . . .	38.6	21.0	17.6	59	2	10	30	35.9	..	..	..	..	..	1 *
11	Petit Manan . . . .	..	..	..	54	3	10	20	34.8	2.05	..	..	..	13	
12	Portland . . . . .	41.1	28.3	12.8	58	2	5	30	33.4	..	..	..	..	..	1 *
15	West Jonesport . .	..	..	..	54	..	..	..	..	..	..	..	..	..	
	<i>New Hampshire.</i>														
323	Alstead . . . . .	..	..	..	56	3	4	20	30.7	2.25	10	6	T	6	2 *
33	Berlin Falls . . . .	..	..	..	..	..	..	..	..	..	..	..	..	..	
34	Berlin Mills . . . .	39.6	19.1	20.5	58	3, 17	—7	30	29.4	2.25	20	2	3	13	
66	Bethlehem . . . . .	34.9	20.8	14.1	54	3	0	30	27.9	1.77	9	4	1	14	
62	Brookline . . . . .	..	..	..	61	3	10	20	32.7	3.35	10	5	T	9	1 *
37	Concord . . . . .	40.0	26.6	13.4	61	3	9	20	33.3	1.73	9	4	T	10	
64	Dublin . . . . .	37.3	23.3	14.0	57	2	5	20	30.3	3.85	14	3	1	13	
67	Durham . . . . .	..	..	..	..	..	..	..	..	..	..	..	..	..	
38	Grafton . . . . .	35.3	23.2	12.1	59	2	—1	20	29.2	2.05	5	4	T	8	1 *
39	Hanover . . . . .	38.4	25.5	12.9	59	1	8	20	31.9	2.46	9	1	1	12	
70	Keene . . . . .	40.6	23.4	17.2	63	3	4	20	32.0	2.04	11	3	T	13	
65	Lancaster . . . . .	37.4	26.6	10.8	62	3	2	30	32.0	1.84	8	4	3	7	
59	Littleton . . . . .	37.3	21.7	15.7	57	3	1	20, 30	29.5	2.02	10	2	0	8	
45	Nashua . . . . .	40.9	25.9	15.0	62	3	10	13, 20	33.4	3.03	10	T	1	10	
57	Newton . . . . .	40.3	23.6	16.7	57	2	6	20	32.0	2.83	5	..	..	9	c
47	North Conway . . .	39.2	19.6	19.6	63	2	1	30	29.4	2.20	12	0	2	5	
61	Peterboro' . . . . .	39.1	21.8	17.3	59	3	1	13	30.4	2.59	12	6	1	12	
49	Plymouth . . . . .	35.2	20.2	15.0	58	3	3	20	27.7	2.27	13	3	1	13	
63	Sanbornton . . . . .	37.8	22.2	15.6	59	3	1	20	30.0	1.27	9	4	T	10	
51	Stratford . . . . .	35.2	22.2	13.0	51	21	—5	30	28.7	1.96	10	5	5	10	
54	West Milan . . . . .	38.1	19.0	19.1	57	3	—8	30	28.6	4.52	20	9	5	14	
	<i>Vermont.</i>														
71	Brattleboro' . . . .	40.8	26.1	14.7	63	3	9	20	33.4	2.25	13	..	4	10	
73	Burlington . . . . .	40.7	28.8	11.9	56	2, 3	11	30	34.7	1.96	7	2	2	9	
75	Cornwall . . . . .	39.1	24.3	14.8	57	3	8	22	31.7	3.64	9	4	1	10	
90	Enosburgh Falls . .	..	..	..	..	..	..	..	..	..	..	..	..	..	
88	Hartland . . . . .	39.2	20.5	18.7	60	3	3	13, 20	29.8	2.58	9	3	T	10	

No.	STATION.	TEMPERATURE.								PRECIPITATION.					Notes.
		1	2	3	4	5	6	7	8	9	10	11	12	13	
	<i>Vermont.</i>	°	°	°	°		°		°	in.	in.	in.	in.		
96	Irasburgh . . .	35.8	19.2	16.6	58	1	—6	30	27.5	3.68	26	..	8	15	
97	Jacksonville . .	35.4	20.6	14.8	57	3	14	29	27.5	2.93	15	4	6	10	
82	Northfield . . .	35.8	21.0	14.8	58	3	—2	20	28.4	2.58	..	..	..	18	
94	Norwich . . . .	..	..	..	55	3	5	20	31.0	2.37	10	5	2	8	2 *
92	Simonsville . . .	36.0	19.6	17.4	56	2	5	20	27.8	..	12	10	0	..	
98	St. Johnsbury . .	36.4	23.6	12.8	56	3	0	30	30.0	1.97	7	2	2	15	
83	Strafford . . . .	..	..	..	54	3	6	20	29.5	3.42	20	8	4	10	1 *
85	Vernon . . . . .	..	..	..	59	3	6	20	32.0	2.83	..	..	..	10	2 *
91	Wells . . . . .	38.1	24.6	13.5	55	2	5	20, 29	31.3	2.62	10	2	1	11	
93	Woodstock . . .	38.5	20.6	17.9	61	3	5	30	29.6	2.58	12	..	T	8	
	<i>Massachusetts.</i>														
192	Adams . . . . .	44.1	27.5	16.6	60	2, 3	12	20	35.8	..	4	..	T	..	
101	Amherst (a) . . .	42.1	26.9	15.2	62	3	9	20	34.5	3.04	5	..	..	9	
102	" (b) . . . . .	41.7	25.8	15.9	65	3	9	20	33.8	3.09	3	..	T	10	
177	" (c) . . . . .	42.5	27.1	15.4	65	3	10	20	34.8	3.14	4	..	..	11	
180	Andover . . . . .	45.2	30.6	14.6	61	4	8	20	37.9	1.85	5	T	2	8	
393	Bedford . . . . .	42.8	25.8	17.0	62	2, 3	11	20, 30	34.3	2.58	7	..	T	12	
103	Beverly Farms .	43.8	28.7	15.1	61	2	9	20	36.2	3.84	12	T	2	14	
104	Blue Hill (sun't)	42.2	28.1	14.1	63	3	9	20	35.1	4.10	..	1	1	13	
174	" " (valley)	43.9	26.3	17.6	66	3	10	20	35.1	4.32	..	..	..	..	
106	Boston . . . . .	44.6	31.9	12.7	66	3	15	30	38.2	3.10	7	0	T	14	
399	Brockton . . . .	46.1	29.1	17.0	67	3	11	30	37.5	4.37	10	T	T	12	
108	Cambridge (a) . .	43.8	29.6	14.2	65	3	12	19	36.7	3.49	..	T	0	12	
109	" (b) . . . . .	44.0	28.2	15.8	65	3	15	20	36.1	3.34	..	..	..	14	
110	Chestnut Hill . .	45.2	28.0	17.2	65	3	11	20	36.6	3.41	10	0	1	10	
182	Concord . . . . .	42.0	26.3	15.7	63	2, 3	10	20	34.2	3.28	12	T	T	12	
117	Dudley . . . . .	39.4	26.8	12.6	55	1, 2	8	20	32.8	1.77	10	0	1	5	
396	East Templeton .	38.0	26.6	11.4	58	3	10	20	31.4	3.43	10	3	T	11	1 *
193	Egg Rock, Nahant	44.3	31.0	13.3	61	3	14	30	37.6	..	..	..	..	..	
386	Fall River . . . .	44.3	33.7	10.6	62	3	17	29	39.0	3.41	7	..	2	12	
120	Fitchburg (a) . .	..	..	..	59	3	12	20, 29	32.4	3.68	10	0	T	11	1 *
121	" (b) . . . . .	40.7	25.3	15.4	61	2, 3	8	20	33.0	3.24	9	2	1	9	
122	Framingham . . .	45.5	24.9	20.6	64	1, 3	8	20	35.2	3.43	8	..	..	12	
407	Gilbertville . . .	41.6	23.0	18.6	55	4	8	20	32.3	..	4	2	T	6	d
124	Groton . . . . .	40.6	24.7	15.9	59	..	8	20	32.6	3.95	16	4	1	13	4
397	Hadley . . . . .	41.8	23.6	18.2	64	2, 3	9	20	32.7	3.78	4	0	T	6	
195	Hyannis . . . . .	48.6	37.2	11.4	64	3	13	20	42.9	3.91	1	0	0	12	
127	Lake Cochituate .	45.2	21.0	24.2	67	3, 4	1	20	33.1	3.53	..	..	..	13	
128	Lawrence . . . .	43.4	26.4	17.0	60	2, 3	10	20	34.9	2.67	8	..	..	15	
391	Leeds . . . . .	41.1	25.6	15.5	62	3	10	20	33.4	3.25	6	1	T	9	
129	Leicester . . . .	..	..	..	..	..	..	..	..	..	..	..	..	..	
130	Leominster . . . .	..	..	..	62	2	13	20	34.1	3.45	9	T	T	11	2 *
131	Long Plain . . . .	..	..	..	64	1	10	20	37.2	5.08	2	..	..	14	2 *
133	Lowell (a) . . . .	42.2	27.6	14.6	63	2	11	20	34.9	3.52	..	..	..	12	
186	" (b) . . . . .	43.4	25.9	17.5	63	3	8	20	34.6	..	..	..	..	..	
176	" (c) . . . . .	43.9	28.5	15.4	66	2	10	20	36.2	..	..	..	..	..	
134	Lyndlow . . . . .	38.7	22.0	16.7	60	3	4	20	30.3	4.07	2	..	1	12	
135	Lynn (a) . . . . .	..	..	..	..	..	..	..	..	..	..	..	..	..	
384	" (b) . . . . .	44.0	30.7	13.3	60	2	15	20, 30	37.4	..	..	..	..	..	
183	Mansfield . . . .	..	..	..	60	3	6	20	34.2	4.39	13	2	T	14	1 *
139	Middleboro' . . .	44.4	27.8	16.6	64	3	6	20	36.2	4.22	6	0	T	14	
140	Milton . . . . .	45.8	29.1	16.7	61	3	12	20	37.4	3.68	..	..	..	10	
194	Monroe . . . . .	37.0	21.7	15.3	57	2	6	20	29.8	3.31	15	6	4	15	
141	Monson . . . . .	43.8	25.8	18.0	63	2	8	20	34.8	4.17	13	0	0	7	
146	Nantucket . . . .	46.6	36.6	10.0	61	3	19	29	41.6	2.80	..	..	..	14	
403	Natick . . . . .	..	..	..	60	2	14	29	34.9	3.89	9	..	1	11	1 *
147	New Bedford (a) .	..	..	..	..	..	..	..	..	..	..	..	..	..	
148	" " (b) . . . . .	47.4	31.3	16.0	63	3	12	20, 30	39.4	4.25	3	..	..	16	
387	North Billerica .	43.5	30.0	13.5	63	3	14	20	36.8	2.41	10	..	..	11	3

No.	STATION.	TEMPERATURE.								PRECIPITATION.					Notes.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
	<i>Massachusetts.</i>	°	°	°	°		°		°	in.	in.	in.	in.		
401	Pittsfield . . .	39.9	26.6	13.3	58	1	10	30	33.2	3.08	..	..	..	8	
153	Plymouth . . .	..	..	..	64	3	14	20	40.5	4.98	3	..	..	11	1 *
155	Provincetown . .	46.7	34.2	12.5	60	3	19	20	40.4	3.17	T	0	0	13	
196	Roxbury . . .	44.5	30.9	13.6	64	3	15	20, 30	37.7	3.77	7	T	T	14	
389	Somerset . . .	..	..	..	64	3	14	20	39.6	4.70	12	T	1	20	1 *
161	Springfield . . .	43.4	29.0	14.4	64	3	14	29	36.2	4.23	6	..	..	9	
164	Taunton (a) . .	45.6	28.5	17.1	65	3	12	13, 20	37.0	4.62	9	..	1	14	
165	" (b) . .	46.1	27.0	19.1	66	3	8	20	36.6	6.21	..	0	1	14	
184	" (c) . .	46.4	27.5	18.9	68	2, 3	10	20	37.0	4.15	10	0	T	11	
197	Turner's Falls. .	..	..	..	..	..	..	..	..	..	..	..	..	..	
398	Vineyard Haven	51.0	36.6	14.4	65	1	20	20, 30	43.8	5.73	2	..	..	15	
181	Wakefield . . .	43.0	28.1	14.9	63	3	11	20, 30	35.6	4.37	10	T	T	13	
168	Wellesley . . .	44.6	26.3	18.3	65	2	10	20	35.4	4.07	..	..	..	9	
169	Westboro' . . .	44.2	26.8	17.4	63	2, 3	10	20	35.5	3.46	9	..	T	10	
170	Williamstown . .	41.4	25.0	16.4	60	2, 3	10	20	33.2	0.65	..	..	..	8	
392	Winthrop . . .	43.1	30.6	12.5	63	3	13	30	36.8	2.79	6	T	T	14	
384	Wood's Hole . .	47.1	35.8	11.3	64	3	17	20	41.4	3.87	..	..	..	17	
185	Worcester (a) . .	42.7	29.0	13.7	69	1	10	20	35.8	2.84	..	..	..	9	d
199	" (b) . .	..	..	..	..	..	..	..	..	..	..	..	..	..	
404	" (c) . .	..	..	..	62	2	11	20	34.3	..	12	..	..	..	1 *
	<i>Rhode Island.</i>														
201	Block Island . .	48.2	36.4	11.8	64	3	20	29	42.2	4.81	T	0	T	15	
202	Bristol . . .	44.9	33.4	11.5	61	3	15	30	39.1	4.14	4	0	1	13	
210	Kingston . . .	44.9	28.9	16.0	63	3	11	20	36.9	5.26	6	..	2	12	
204	Newport . . .	48.4	35.0	13.4	64	3	18	29	41.7	..	..	..	..	..	
206	Pawtucket . . .	44.5	29.7	14.8	64	3	17	29	37.1	3.54	10	0	1	12	8
207	Providence (a) .	44.4	32.1	12.3	64	3	16	20	38.2	3.52	8	..	..	12	
212	" (b) . .	44.0	29.4	14.6	64	3	12	20	36.7	4.00	7	T	1	13	
	<i>Connecticut.</i>														
457	Bridgeport . . .	..	..	..	62	2, 3	16	20	38.3	5.85	3	0	T	14	1 *
221	Canton . . .	42.6	29.0	13.6	61	3	7	20	35.8	3.55	6	T	2	8	
222	Colchester . . .	43.8	27.7	16.1	67	2	11	20	35.7	4.51	8	T	2	9	
455	Hartford . . .	42.3	30.5	12.1	62	3	16	20, 29	36.2	..	..	..	..	..	
452	Middletown . . .	43.9	29.5	14.4	64	2, 3	13	20	36.8	5.72	8	T	2	12	
454	New Hartford . .	..	..	..	..	..	8	20	36.1	4.04	7	1	0	8	1 *
228	New Haven . . .	43.3	31.1	12.2	64	3	15	20	37.2	4.23	..	..	..	13	
229	New London . . .	44.8	32.3	12.5	63	3	15	20	38.6	4.75	..	..	..	15	
250	N. Grosvenor Dale	41.0	25.7	15.3	63	3	9	20	33.4	3.89	9	..	..	9	8
451	Norwalk . . .	43.8	28.2	15.6	61	2, 3	13	20	36.0	5.55	5	..	..	11	
458	Southington. . .	..	..	..	61	3	13	20	34.9	4.50	6	..	..	14	1 *
237	Storrs . . .	41.6	26.5	15.1	64	2	8	20	34.1	4.00	7	1	2	11	
231	Thompson . . .	..	..	..	60	2	11	20	..	..	..	..	..	..	1 *
233	Voluntown . . .	45.4	27.9	17.5	63	3	7	20	36.6	4.45	7	..	2	10	
235	Waterbury . . .	44.5	29.6	14.9	63	2	14	20	37.0	4.30	5	T	1	11	
461	Windsor . . .	41.2	27.9	13.3	61	3	13	20	34.5	4.12	9	1	T	14	

Notes.—Letters indicate the number of days missing from the temperature reports: thus a, one day; c, three days.—\*Maximum and minimum temperatures from thermometers not self-registering. <sup>1</sup>—Thermometers read at 7 A.M., 2 and 9 P.M.; mean obtained by formula:  $\frac{1}{3}(7+2+9)$ . <sup>2</sup>—Mean temperatures from thermometer readings at other hours than 7 A.M., 2 and 9 P.M.; they are corrected to true daily mean by table in Chief Signal Officer's report "Mean Temperatures and their Corrections" by Alexander McAdie, M. A., 1891. <sup>3</sup>—Mean temperature from records of thermograph. <sup>4</sup>—Maximum on 2nd, 3rd, 4th, 16th.

## STATIONS REPORTING PRECIPITATION ONLY.—NOVEMBER, 1894.

No.	STATION.	Total Precip.	Snow-fall.	No.	STATION.	Total Precip.	Snow-fall.
		<i>in.</i>	<i>in.</i>			<i>in.</i>	<i>in.</i>
32	Belmont, N. H. . . .	1.85	..	159	Salem, Mass. . . .	3.68	11
40	Lakeport, " . . .	1.95	..	394	Salisbury, " . . .	2.27	9
44	Mine Falls, " . . .	2.69	..	166	Waltham, " . . .	3.83	..
48	Pennichuck Station, " . . .	2.94	..	381	Webster, " . . .	4.19	9
53	Weir's Bridge, " . . .	1.52	..	395	Winchendon, " . . .	2.06	11
55	Wolfboro', " . . .	1.16	..	171	Winchester, " . . .	3.54	..
187	Ashland, Mass. . . .	3.42	..	203	Lonsdale, R. I. . . .	3.90	9
107	Boston, " . . .	3.31	..	460	Colebrook River, Conn. . . .	..	..
400	Brockton, (a) " . . .	4.12	..	247	Falls Village, " . . .	4.15	19
402	" (b) " . . .	3.94	..	456	Greenfield Hill, " . . .	5.41	5
112	Clinton, " . . .	2.50	..	224	Hartford, " . . .	4.72	9
119	Fiskdale, " . . .	3.08	..	225	Lake Konomoc, " . . .	4.98	..
160	Hingham, " . . .	4.50	8	249	Lebanon, " . . .	..	..
142	Mt. Nonotuck, " . . .	3.71	10	227	New Hartford, " . . .	..	..
143	Mystic Lake, " . . .	3.49	..	248	So. Manchester, " . . .	4.29	14
144	Mystic Pumping Sta., " . . .	3.46	..	238	Stevenson, " . . .	..	..
150	Newburyport " . . .	1.15	..	234	Wallingford, " . . .	6.85	6
156	Randolph, " . . .	4.10	11	245	W. Simsbury, " . . .	4.16	8
179	Robert's Dam, " . . .	2.89	4				

STATIONS REPORTING BAROMETER, WIND MOVEMENT  
AND RELATIVE HUMIDITY FOR NOVEMBER, 1894.

No.	STATION.	BAROMETER.						Mean Rel. Hum.	WIND.		
		Mean.	Highest.	Date.	Lowest.	Date.	Monthly Range.		Total Movement.	Greatest velocity direction & date.	Prev'l Dir't'n.
		<i>in.</i>	<i>in.</i>		<i>in.</i>		<i>in.</i>	<i>p. c</i>	<i>m.</i>	<i>m.</i>	
1	St. John, N. B. . . .	29.94	30.65	30	29.06	6	1.59	89	6504	36—3	NW
9	Eastport, Me. . . .	29.97	30.66	30	29.15	6	1.51	73	10096	56—SE—3	W
12	Portland. . . . .	29.98	30.66	30	29.43	6	1.23	76	6288	38—S—3	SW
45	Nashua* N. H. . . .	30.03	30.68	30	29.47	3	1.21	77	4160	24—NW—28	NW
71	Brattleboro, Vt. . .	30.06	30.68	29	29.51	3	1.17	78	8537	40—NW—28	..
82	Northfield . . . .	30.05	30.71	29	29.55	3	1.16	74	7508	42—SW—3	S
177	Amherst, Mass.* . .	30.08	30.73	29	29.51	3	1.22	71	4179	..	NW
104	Blue Hill* . . . .	30.04	30.70	30	29.30	6	1.40	74	16220	65—NW—6	W
106	Boston . . . . .	30.06	30.68	30	29.47	5	1.21	70	8761	38—SW—3	W
182	Concord . . . . .	..	..	..	..	..	..	..	..	..	..
129	Leicester . . . . .	..	..	..	..	..	..	..	..	..	..
176	Lowell . . . . .	30.02	30.70	30	29.53	3	1.17	84	..	..	..
146	Nantucket . . . . .	30.06	30.66	30	29.29	5	1.37	73	9869	60—NE—6	N
196	Roxbury . . . . .	30.05	30.68	29	29.51	5	1.17	..	..	..	NW
398	Vineyard Haven. . .	..	..	..	..	..	..	..	8468	60—NE—5	SW
384	Wood's Hole . . . .	30.04	30.65	29	29.31	5	1.34	..	14488	69—N—6	NW
201	Block Island, R. I. .	30.07	30.68	29	29.19	5	1.49	74	13855	78—E—5	NW
207	Providence* . . . .	30.00	30.64	30	29.25	6	1.39	72	6192	26—NE—5	NW
455	Hartford, Conn. . .	30.09	30.67	29	29.40	5	1.27	73	..	..	NW
228	New Haven . . . .	30.07	30.69	29	29.35	5	1.34	73	7584	36—SW—27	N
229	New London . . . .	30.10	30.71	29	29.32	5	1.39	80	6332	46—S—3	NW
237	Storrs . . . . .	30.07	30.65	29	29.42	5	1.23	..	7010	50—28	NW
251	Albany, N. Y. . . .	30.08	30.74	29	29.58	3	1.16	81	6033	38—SE—3	S
255	New York City . . .	30.10	30.70	29	29.49	5	1.21	72	8575	40—SW—28	NW

\* Pressure data from self-recording barometer.

Reports have been received from 178 observers in season to be used in compiling the following review.

ATMOSPHERIC PRESSURE  
(IN INCHES AND HUNDREDTHS).

Mean barometer, 30.05 (21 stations); highest observed, 30.74 at Albany (N. Y.) on the 29th; lowest observed, 29.06 at St. John (N. B.) on the 6th; range, 1.68; greatest local monthly range, 1.59 at St. John; least local monthly range, 1.16 at Northfield and Albany.

Eleven cyclones and nine anticyclones influenced the weather of New England for the month of November. Of the anticyclones that of the 29th–30th gave the highest pressure for the month, and the sharpest cold wave in the northwest and in some parts of New England. The anticyclone which spread over the whole eastern part of the country on the 19th–20th covered the greatest area and gave the lowest temperature for the month over most of New England. Seven of the cyclones passed easterly to the north of New England, one moved across our district from west to east, one passed easterly to the south of us, and one formed just south of New England and moved up our eastern coast. Most of the cyclones were of good size and energy, with strong barometer ranges and rapid changes in the wind, temperature, and weather. The last named cyclone in the list above was the most severe for the month in all southern sections. It formed off the New Jersey coast on the 5th and passed east of us with rapidly increasing energy giving heavy rain and snow and high gales. The snow was very damp and froze to whatever it came in contact. Telegraph and telephone wires were like great cables and trees and shrubs were heaps of ice and snow. The weight of this load with the high gale that prevailed did great damage to fruit and shade trees and brought down telegraph poles by the hundreds. The telegraph and telephone service in all southern New England was crippled and railroad trains greatly delayed by fallen poles and trees. The following report from Mr. C. H. Wilmarth, Voluntary Observer at Taunton, will undoubtedly apply as well to other cities: "The storm of the 5th–6th was the severest ever known in Taunton. Rain commenced falling at 8.30 A. M. on the 5th and

continued heavily until 11 P. M. with a tremendous northeast gale. At that hour it commenced to snow and by 7 A. M. on the 6th eight inches of damp heavy snow was on the ground, and trees and poles, wires, etc., were covered with several inches. Wires usually the size of a pen holder looked like great white cables three inches in diameter. On the 6th not one of the fire alarm wires could be used. All over the city the fire-alarm, telephone and telegraph wires were broken and dangling in the streets. Poles were down in every direction and hundreds of trees were prostrated." Several horses were killed by falling wires in Boston on the morning of the 6th and great danger to life from that cause was reported from other cities. At Hyannis the wind was reported by old residents to be the hardest ever known; chimneys, trees, fences, and out buildings were thrown down. G. E. Fuller, M. D., of Monson reports it the hardest storm of the kind in 26 years. Two gunners were lost in a cedar swamp in Whitman, Mass., and perished in the storm.

TEMPERATURE (DEG. F.).

Monthly mean, 34.2 (134 stations); highest monthly mean, 43.8 at Vineyard Haven; lowest monthly mean, 27.3 at Mayfield; maximum, 69 at Worcester (*a*), on the 1st; minimum, —8 at West Milan on the 30th; range for New England, 77; greatest local monthly range, 70 at Farmington; least local monthly range, 41 at Provincetown; greatest daily range, 43 at West Milan on the 21st; least daily range, 0 at Concord (N. H.) on the 28th and at Stratford on the 7th and 12th.

The average temperature for November for twenty stations having records for more than ten years is 38.6; average for November 1894, 35.2; departure, —3.4. The first three days were the warmest and the 20th and 30th were the coldest for the month. The cold wave on the 6th–7th following the severe snow storm gave the first killing frost of the season in many southern districts; the following are among the places where no previous damaging frost had been felt: Hadley, Hyannis, Leeds, Leominster, Roxbury, Wood's Hole, Block Island, Bristol, Greenfield Hill. At Woodstock, only five years in the past 21 show a colder November. At

Blue Hill it was the coldest November in the past ten years. At Monroe it was the coldest in seven years of observation and at Southington, the only Novembers colder in the past 25 years were in 1873, 1875 and 1882. At Boston this year gave the coldest Thanksgiving Day since 1873.

#### PRECIPITATION

(IN INCHES AND HUNDREDTHS).

Monthly average, 3.36 (153 stations); greatest amount, 6.85 at Wallingford; least, 0.65 at Williamstown. The average precipitation for November for thirty stations having records for more than ten years is 3.92; average for November 1894, 3.61; departure, —0.31.

In southwestern New England there was a slight excess in the precipitation but in all central and northern districts there was a marked deficiency. The month has been very disagreeable in the north with much cloudy and stormy weather though the total precipitation was light. The streams and wells there are much lower than usual at this season.

*Snow*: At Block Island only a trace of snow fell during the month, and at Provincetown only one half inch, but over the greater part of the southern states from 2 to 12 inches came; from 5 to 25 inches fell in northern districts. The ground was fairly well covered with snow during the month and no damage has occurred from the cold weather. The snow of the 5th–6th was heaviest from 20 to 40 miles from the coast. A great deal of garden truck and vegetables were caught out in this storm much of it remaining until the warm spell after the 14th, but no great damage has been reported.

#### MISCELLANEOUS PHENOMENA.

*Wind*: Prevailing direction, northwest; maximum velocity, 78 miles per hour from the east at Block Island on the 5th; greatest monthly wind movement 16,220 at Blue Hill; least, 4,160 at Nashua. A great deal of damage was done to telegraph and telephone poles and to fruit and shade trees on the 5th–6th, and some damage resulted to shipping and coast property, but many vessels remained in the harbors and rode the gale in safety.

*Thunderstorms*: 1st, Gardiner (thunder and sharp lightning); 3d, Randolph (thunder), West Simsbury (distant thunder); 5th, Hyannis, New Bedford, Kingston, Colchester, Hartford Middletown, New Hartford, Voluntown.

*Hail*: 3d, Grafton; 14th, Windsor; 17th, Bethlehem; 25th, North Billerica, Westboro.

*Sleet*: 5th, Hartland; 5th, 10th, 14th, Windsor; 8th, Bristol; 9th, Monroe; 24th, Blue Hill.

*Killing Frosts*: The first killing frost of the season occurred at many places in the southern states on the night of the 6th–7th.

*Solar Halos*: 8th, 15th, 18th, 20th, 24th, 26th.

*Lunar Halos*: 7th, 8th, 12th.

*Parhelia*: 8th, Plymouth (N. H.); 22d, Strafford.

*Auroras*: 6th, East Templeton; 7th, Hartland (faint glow), Cambridge (suspected); 11th, 17th, Hanover; 19th, Plymouth (N. H.); 23d, Jacksonville; 17th, 24th, 28th, Cornish.

#### LATE REPORTS.

Maximum, minimum and mean temperature and total precipitation for each station.

*August*: Brockton, 89, 44, 67.0, 1.26; Lynn (a), 86, 46, 65.8, 2.56; Waltham, 1.48.

*September*: Orono, 90, 27, 59.2, 3.40; Petit Manan, 73, 45, 56.1; Peterboro, 88, 27, 60.4, 5.11; Burlington, 80, 31, 64.2, 2.88; Strafford, 78, 38, 59.1, 3.70; Hadley, 91, 29, 63.6, 5.16; Monroe, 82, 28, 58.5, 6.17. Precipitation only: Kendal Green, 2.56; Randolph, 2.78; Waltham, 2.29; New Hartford, 4.54.

*October*: Bar Harbor, 64, 36, 49.6, 4.96; Petit Manan, 58, 40, 49.2; Peterboro, 74, 25, 47.4, 3.82; Irasburg, 67, 30, 45.8, 4.03; Jacksonville, 68, 26, 43.5, 5.08; Amherst (c), 75, 32, 51.6, 4.85; Ludlow, 70, 27, 48.5, 4.03; Lynn (a), 68, 34, 50.5, 5.79; North Billerica, 76, 34, 52.6, 5.24; Plymouth (Mass.), 72, 37, 54.7, 7.91; Vineyard Haven, 72, 41, 56.6, 10.88; Wood's Hole, 70, 42, 55.6, 9.29. Precipitation only: Hingham, 7.34; Waltham, 5.92; New Hartford, 6.46.

#### ERROR.

*September*: Precipitation at Chestnut Hill was 2.50 instead of 3.50.

J. WARREN SMITH, *Editor*.  
BOSTON, MASS., December 15, 1894.